IS 4818 (1996): Sorbic Acid, Food Grade [FAD 8: Food Additives]

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IS 4818 : 1996
(Reaffirmed 2001)

भारतीय मानक
सोरबिक अम्ल, खाद्य ग्रेड — विशिष्टि
(पहला पुनरीक्षण)

Indian Standard
SORBIC ACID, FOOD GRADE — SPECIFICATION
(First Revision)

ICS 67.220.20

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1996

Price Group 2

FOREWORD

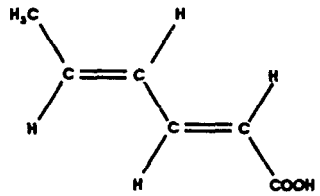
This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties of the processed foods. As certain impurities in these substances could be harmful, it is necessary to have a strict quality control of these food additives. A series of standards was, therefore, prepared by this Institution to cover purity and identification of these substances. These standards would help in checking purity, which requires to be checked at the stage of manufacture, for it is extremely difficult (and in many cases impossible) to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specifications that are accepted by scientists, health authorities and international bodies, and the consumer industries to use them within the quantity permitted by the health authorities.

Sorbic acid, food grade used as a food additive is permitted under *Prevention of Food Adulteration Rules*, 1955. These rules, *inter-alia* prescribe:

> 'The listed food additives permitted for use in certain foods shall be sold only under the BIS Certification Mark.' Sorbic acid, food grade is one such item.

Chemical Names and Formula — The recognized chemical names are sorbic acid; trans, all trans 2, 4-hexadienoic acid. Empirical formula is $C_6H_8O_2$. Its molecular weight is 112.13. Structural formula is:



STRUCTURAL FORMULA

This standard was first published in 1968 and is being revised to incorporate the following additions/changes:

a) To upgrade the standard by reducing the moisture content considerably.
b) To bring the requirement of solubility under description section to make it in line with the Food Chemicals Codex, NRC.
c) To substitute the requirement of lead by heavy metals and the corresponding test method.
d) To include instruction for storage under marking clause.

In the formulation of this standard, considerable amount of assistance has been derived from 'Food Chemical Codex', issued by the National Academy of Sciences, National Research Council, Washington.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SORBIC ACID, FOOD GRADE — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and tests for sorbic acid, food grade.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
1070 : 1992	Reagent grade water (*third revision*)
1699 : 1995	Methods of sampling and test for synthetic food colours (*second revision*)
2362 : 1993	Method for determination of water by the Karl Fischer method (*second revision*)
4448 : 1994	Benzoic acid, food grade (*first revision*)
5058 : 1996	Sodium citrate, food grade (*first revision*)

3 DESCRIPTION

3.1 It is slightly soluble in water and soluble in ethanol.

NOTE — The solubility is intended only as information regarding approximate solubility and is not to be considered as a quality requirement and is of minor significance as a means of identification or determination of purity, and dependence must be placed on other specifications.

4 REQUIREMENTS

4.1 Identification

4.1.1 *Melting Range*

The melting range of the material shall be 132°C to 135°C when determined by the method given in Annex A of this standard.

4.1.2 When to 1 ml of saturated solution of bromine in water, 0.02 g of the material is added and shaken well, the colour shall disappear.

4.2 The material shall also conform to the requirements given in Table 1.

Table 1 Requirements for Sorbic Acid, Food Grade

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Annex of This Standard	Other Indian Standards
(1)	(2)	(3)	(4)	(5)
i)	Purity, as $C_6H_8O_2$, percent by mass (on dry basis), *Min*	99	B	—
ii)	Moisture, percent by mass, *Max*	0.5	C	—
iii)	Sulphated ash, percent by mass, *Max*	0.2	—	Annex C of IS 4448 : 1994
iv)	Aldehydes, percent by mass, *Max*	0.1	D	—
v)	Stability	To pass test	E	—
vi)	Arsenic (as As), mg/kg, *Max*	3	—	Cl 15 of IS 1699 : 1995
vii)	Heavy metals, as (Pb), mg/kg, *Max*	10	—	Annex E of IS 5058 : 1996

5 PACKING, STORAGE AND MARKING

5.1 Packing

The material shall be filled in amber colour glass containers or any other containers with as little air space as possible. The containers shall be such as to preclude contamination of the contents with metals or other impurities.

5.2 Storage

The material shall be stored in a cool and dry place so as to avoid excessive exposure to heat.

5.3 Marking

Each container shall be legibly and indelibly marked with the following information:

a) Name of the material including the words 'Food Grade';
b) Name and address of the manufacturer;
c) Net content when packed;
d) Batch or code number;
e) Instruction for storage;
f) Expiry date; and
g) Any other information as given under the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977 and *Prevention of Food Adulteration Act*, 1955.

5.3.1 *BIS Certification Marking*

The product may also be marked with the Standard Mark.

5.3.1.1 The use of the Standard mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

6.1 Representative samples of the material shall be drawn according to the method prescribed in **4** of IS 1699 : 1995.

7 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070 : 1992) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the experimental results.

ANNEX A
(*Clause* 4.1.1)
DETERMINATION OF MELTING RANGE

A-1 APPARATUS

A-1.1 Suitable glass apparatus provided with an appropriate liquid like paraffin or silicone oil with a suitable stirring device, an accurate thermometer to read the melting range expected and a controlled source of heat.

Capillary tube : 10 cm long and 0.8 to 1.2 mm internal dia with wall thickness of 0.8 to 1.2 mm.

A-1.2 Procedure

Dry the material over a suitable desiccant, say sulphuric acid for 24 hours. Charge a capillary glass tube, one end of which is sealed, with sufficient quantity of the dry powder to form a column in the bottom of the tube, of 2.5-3.5 mm high when packed down as closely as possible by moderate tapping on a solid surface.

Heat the bath until a temperature 10 ± 1°C below the expected melting range is reached, then introduce the charged tube previously attached to the thermometer with its closed end at the level of the middle of the bulb so that the thermometer bulb is 2 cm above the bottom of the bath, and heat at a rate of raise of 1°C per minute.

Note the temperature at which the column of the sample is observed to collapse definitely against the side of the tube at any point which is the beginning of melting. Note the temperature at which the sample becomes liquid throughout which is the end of melting. The two temperatures shall fall within the limits of the melting range.

ANNEX B

[*Table* 1, *Sl No.* (i)]

DETERMINATION OF PURITY

B-1 REAGENTS

B-1.1 Sulphuric Acid

B-1.2 Sodium Hydroxide — 1 N.

B-1.3 Phenolphthalein Indicator

Dissolve 0.2 g of phenolphthalein ($C_{20}H_{14}O_4$) in 60 ml 90 percent ethanol and add a sufficient quantity of water to produce 100 ml.

B-2 APPARATUS

B-2.1 Vacuum Desiccator

B-2.2 Titrimetric Method

Weigh 1.500 g of the material, previously dried in a vacuum desiccator over concentrated sulphuric acid for 24 hours. Dissolve in about 25 ml of ethanol, titrate with 1 N sodium hydroxide using phenolphthalein as indicator.

Calculation : 1 ml of 1 N sodium hydroxide = 0.112 1 g of sorbic acid.

ANNEX C

[*Table* 1, *Sl No.* (ii)]

DETERMINATION OF MOISTURE

C-1 Two methods for determination of moisture are specified. In case of dispute Method I shall be used.

C-2 METHOD I

C-2.1 Karl Fischer method as in IS 2362 : 1993.

C-3 METHOD II

C-3.1 Procedure

Weigh accurately about 10 g of the material in a tared petri dish and spread the sample evenly. Dry it over sulphuric acid in a desiccator for 24 hours. Remove the petri dish and weigh. Calculate the percentage of moisture.

ANNEX D

[*Table* 1, *Sl No.* (iv)]

DETERMINATION OF ALDEHYDES

D-1 REAGENTS

D-1.1 Schiff's Reagent

Aqueous solution of 0.125 g of crystalline rose aniline chlorohydrate in 1 000 ml and decolourized with sulphuric acid.

D-1.2 Formldehyde Solution

D-2 PROCEDURE

D-2.1 Prepare a saturated aqueous solution of the material. In a test tube to 1 ml of this solution add 0.5 ml of Schiff's reagent and allow to stand for 10 to 15 minutes. Compare the colour with that produced by 1 ml of formaldehyde solution corresponding to 0.1 percent of aldehydes, with the same amount of Schiff's reagent under the same conditions. The colour produced in the test solution shall not be more intense than that in the formaldehyde solution.

ANNEX E

[*Table* 1, *Sl No.* (v)]

TEST FOR STABILITY

E-1 APPARATUS

Suitable oil-bath with thermostatic control.

E-2 PROCEDURE

E-2.1 Place 10 g of the material in a test tube and heat in an oil-bath at 105 ± 1°C for 90 minutes. The test-tube should be immersed in the oil-bath so that the upper level of the material is 2 cm below the surface of the oil. The material shall be taken as having passed the test if no discolouration occurs.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

This Indian Standard has been developed from Doc : No. FAD 8 (466).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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